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EXAMINER

YAM, STEPHEN K

ART UNIT PAPER NUMBER

2878

DATE MAILED: 05/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/099,705

Applicant(s)

HALMOS, MAURICE J.

Examiner

Stephen Yam

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Double Patenting*

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1, 3-9, 14, 17, and 18 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-8, 10, 14, and 20 of copending Application No. 09/797,220. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claim language in both applications provide identical components for the claims (e.g.- mode-locked laser transmitter, receiver for detecting signals transmitted by the laser and reflected off an object, and signal processor, for Claim 1 of both applications) with minor alterations.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

### *Priority*

The continuation information in Page 1 of the specification is incorrect, as the filing date of the cross-referenced application (09/797,220) is June 11, 2001, not March 1, 2001 as listed.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 9-11, 14-16, and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Paranto et al. US Patent No. 5,621,514.

Regarding Claim 1, Paranto et al. teach (see Fig.) a ladar system comprising a mode locked laser transmitter (26), a receiver (29) adapted to detect signals transmitted by the laser and reflected by an object, and a signal processor (32, 33) for analyzing the signals.

Regarding Claim 9, Paranto et al. teach the signal processor including a range demultiplexer (see Abstract, lines 16-18 and Col. 3, lines 60-63) for organizing the signals into range bins.

Regarding Claim 10, Paranto et al. teach the signal processor including means for extracting a signal (see Abstract, lines 16-18) representing Doppler frequencies detected for each range bin.

Regarding Claim 11, Paranto et al. teach said means for extracting Doppler frequencies including means for computing a frequency spectrum associated with each range bin (see Abstract, lines 16-18).

Regarding Claim 14, Paranto et al. teach the signal processor including means for extracting a signal representing intensity (inherent within a “frequency spectrum” output) of the signal detected for each range bin (see Abstract, lines 16-18).

Regarding Claim 15, Paranto et al. teach a local oscillator (27) for generating a reference beam (see Col. 2, lines 37-38).

Regarding Claim 16, Paranto et al. teach (see Fig. and Col. 2, lines 49-51) the receiver combining said reflected signal with said reference beam.

Regarding Claim 18, Paranto et al. teach (see Fig.) a method for ladar including transmitting (26) a series of mode locked laser pulses (see Col. 2, lines 40-52), receiving and detecting (29) returns of the transmitted signals as the signals are reflected by an object, and analyzing (32, 33) the signals to extract range and cross-range information (see Col. 2, line 64 to Col. 3, line 8).

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Paranto et al. in view of Gross US Patent No. 4,687,281.

Paranto et al. teach the system in Claim 1, according to the appropriate paragraph above. Paranto et al. do not teach the system as a synthetic aperture ladar system that includes means for

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moving said ladar system while said ladar system operates. Gross teaches a ladar system as a synthetic aperture ladar system (see Col. 1, lines 39-41 and 55-59) with means for moving the ladar system (see Col. 5, lines 3-4) while said ladar system operates. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a synthetic aperture ladar system and include means for moving said ladar system during operation as taught by Gross in the system of Paranto et al., to provide accurate long-range ladar for high-resolution satellite imagery.

7. Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paranto et al. in view of Rice et al. US Patent No. 6,061,170.

Paranto et al. teach the system in Claim 1, according to the appropriate paragraph above. Regarding Claim 6, Paranto et al. teach means (26) for pumping the laser via an optical fiber (see Col. 2, lines 40-41). Paranto et al. do not teach the laser as an erbium-doped crystal laser or an erbium, ytterbium-doped laser. Rice et al. teach a laser for a ladar system (see Col. 8, lines 49-51) wherein the laser is an erbium-doped crystal laser (see Col. 2, lines 22-25 and Col. 11, lines 55-62) and erbium, ytterbium-doped (see Col. 2, lines 22-25) laser pumped via an optical fiber (see Col. 2, lines 18-22 and 28-30). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the laser of Rice et al. in the system of Paranto et al., to increase laser output power for long range ladar (see Col. 8, lines 48-51).

8. Claims 3 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paranto et al. in view of Kafka et al. US Patent No. 6,421,573.

Paranto et al. teach the system in Claim 1, according to the appropriate paragraph above. Paranto et al. do not teach the laser transmitter including a laser and means for mode locking the output thereof, said mode-locking means including a quantum well absorber. Kafka et al. teach (see Fig. 1) a mode-locked laser transmitter (10) including a laser (12, 18), and means (19) for mode locking the output thereof, including a quantum well absorber (see Col. 4, lines 57-59 and 65-67). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the laser of Kafka et al. in the system of Paranto et al., to increase laser output power while utilizing a commonly-constructed laser assembly.

9. Claims 3 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paranto et al. in view of Coppock et al. US Patent No. 4,339,821.

Paranto et al. teach the system in Claim 1, according to the appropriate paragraph above. Paranto et al. do not teach the laser transmitter including a laser and means for mode locking the output thereof, said mode-locking means including an acoustic crystal. Coppock et al. teach (see Fig. 1) a mode-locked laser transmitter (10, 18) including a laser () and means (18) for mode locking the output thereof, including an acoustic crystal (see Col. 1, lines 49-54 and Col. 2, lines 24-27 and 36-43). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use an acoustic crystal in the laser transmitter as taught by Coppock et al. in the system of Paranto et al., to provide increased laser efficiency, as taught by Coppock et al. (see Col. 1, lines 45-48).

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10. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Paranto et al. in view of Phillips et al. US Patent No. 5,835,199.

Paranto et al. teach the system in Claim 10, according to the appropriate paragraph above. Paranto et al. do not teach the means for computing a frequency spectrum including a Fast Fourier Transform. Phillips et al. teach a ladar system (see Col. 3, lines 13-21) using a Fast Fourier Transform (see Col. 31, lines 53-56) to compute and analyze a frequency spectrum (see Col. 31, line 56 to Col. 32, line 6). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a Fast Fourier Transform as taught by Phillips et al. in the means for computing a frequency spectrum in the system of Paranto et al., to utilize common processors already designed for performing FFT frequency computations, to save costs and simplify system design.

11. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Paranto et al. in view of Pearson US Patent No. 4,516,853.

Paranto et al. teach the system in Claim 11, according to the appropriate paragraph above. Paranto et al. do not teach the means for extracting Doppler frequencies further including means for detecting centroids of said frequency spectrums. Pearson teaches a ladar system comprising a mode locked laser transmitter (110, 122, 132) (see Col. 3, lines 2-3 and Col. 4, lines 9-10), a receiver (129, 134) adapted to detect signals transmitted by the laser and reflected (from (172) from an object (170), and a signal processor (127, 220) for analyzing the signals, wherein the centroids of the frequency spectrums are detected (see Col. 3, lines 50-56). It would have been obvious to one of ordinary skill in the art at the time the invention was made to detect the



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centroids of the frequency spectrums as taught by Pearson in the system of Paranto et al., to detect the velocity and movement of the object, as taught by Pearson (see Col. 4, lines 50-56).

12. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Paranto et al. in view of Low et al. US Patent No. 3,737,231.

Paranto et al. teach (see Fig.) a ladar system comprising a laser transmitter (26), a receiver (29) adapted to detect signals transmitted by the laser and reflected by an object, and a signal processor (32, 33) for analyzing the signals. Paranto et al. do not teach the laser transmitter comprising a resonant cavity, a gain medium disposed with the cavity, and a mode locking mechanism in communication with the medium for transmitting a mode locked signal from the cavity. Low et al. teach (see Fig. 1) a laser transmitter for a ladar system (see Col. 1, lines 62-63 and Col. 2, lines 6-11) with a resonant cavity (10), a gain medium (11) disposed with the cavity, and a mode locking mechanism (13) in communication with the medium for transmitting a mode locked signal from the cavity. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the laser transmitter of Low et al. in the system of Paranto et al., to provide ideal optical pulses for ladar purposes (see Col. 2, lines 29-34) having increased output power (see Col. 2, lines 35-39)

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*Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen Yam whose telephone number is (703)306-3441. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (703)308-4852. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-7724 for regular communications and (703)308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

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SY  
May 7, 2003



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